

JAN 16 2008

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Case Docket No. 7395
Date: January 16, 2008

Mail Stop Appeals - Patents
COMMISSIONER OF PATENTS
PO Box 1450
Alexandria, VA 22313-1450

Re: Application of: Hitch
Serial No.: 10/812,457
Filed: March 30, 2004

Art Unit: 1771
Examiner: COLE, Elizabeth M.

For: NONWOVEN FIBER MATS WITH SMOOTH SURFACES AND METHOD

Transmitted herewith is/are the following document(s) related to the above-identified application:

- ☒ Reply Brief (18 pages)
☐ Appeal Brief (16 pages)
☐ Request for Oral Hearing

Please extend the time for filing the Notice of Appeal _____ () month to _____.

The fee has been calculated as shown below:

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In re Application of: Hitch

Art Unit: 1771

Serial No. 10/812,457

Case Docket No. 7395

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Examiner: Cole, Elizabeth M.
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For: NONWOVEN FIBER MATS WITH SMOOTH SURFACES AND METHOD

Commissioner of the Patents & Trademarks
Washington, D. C. 20231

Dear Sir:

REPLY BRIEF

In response to the Final Office Action mailed on March 30, 2006, the Advisory Action mailed May 10, 2006, Applicant has appealed the final rejection of the claims 1-8, 14 and 15, set forth in the Claims Appendix of this brief. This also in response to the Notification of Non-Compliant Appeal Brief mailed August 14, 2007, the Fourth Amended Appeal Brief is submitted below. Finally, this Reply Brief is in response to the Examiner's answer mailed on November 27, 2007, dropping the rejection under 35 USC 102 (b) and setting forth a so-called new ground of rejection under 35 USC 103(a).

This Reply Brief was prompted by the dropping the rejection of the claims under 35 USC 102. In the Appeal Brief, the rejection of the claims under 35 USC 103 relied in part on discussion responding to the rejection of the claims under 35 USC 102.

Real Party In Interest:

The real party in interest is Johns Manville, assignee of the inventor, Hitch.

Related Appeals and Interferences

NONE

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Status of the Claims

Claims 1-8, 14 and 15 were finally rejected under 35 USC 112, first and second paragraphs. Claims 3,4,7,8,14 and 15 stand finally rejected under 35 USC 103(a). A rejection of double patenting was overcome by the filing of a Terminal Disclaimer filed on May 3, 2006. Applicant appeals from the Final Rejection under 35 USC112, first and second paragraphs and 35 USC 103. Claims 9-13 were cancelled earlier.

Status of Amendments

After the Final Office Action mailed March 30, 2006, a Rule 1.116 amendment was filed. Though the Examiner had made new rejections in the Final Office action, the amendment was not entered and the Examiner maintained the Final Rejection.

Summary of the Claimed Invention:

Independent claim 1 involves nonwoven fibrous mats having a smooth surface for coating, page 1, lines 3-5 of the specification, and having a reduced amount of "stand-up" fibers, see page 2, lines 9-14, page 3, lines 5-9 and page 7, lines 6-8 and 15-19, the result of being comprised of a blend of at least two different lengths of fibers, about 25 to about 50 wt. percent of the fibers being less than about 0.4 inch long, see page 3, lines 6-7 & 12 and page 7, lines 3-4 & 14, and about 75 to about 50 wt. percent of the fibers having a length of at least 0.45 inch long, see page 3, lines 11-2 and page 7, lines 2-3 & 13, all of the fibers being in the range of about 0.12 inch to about 0.6 inch long, see page 4, lines 16-17

and having a diameter in the range of about 9 -14 microns, see page 4, lines 15-16. These fibers are bound together with about 10-25 wt. percent of a cured binder, see original claim 1. The combination of different fiber lengths in the ratio claimed produces an improved surface for painting or coating of the fibrous nonwoven mat as a result of having a substantial reduction in "stand up fibers" compared to the prior art mats, see Examples 2 and 3, particularly page 7, lines 6 & 16-19.

The term "stand up fibers" refers to fibers that protrude from a surface of the mat various distances and they caused defects in painted surfaces and prior art mats required heavy coatings to avoid visual defects in the painted or coated surfaces of installed wallboard, see page 2, second full paragraph and the latter part of the third full paragraph. When many "stand up fibers" are present on the surface of the mat, typical of prior art mats, the surface of the mat requires a heavy coating to achieve a nice painted appearance, explained on page 2, lines 9-24, particularly important when the mat or coated mat is used as a facer on products such as gypsum wallboard, a typical application for the mats of the present invention. The mats of Examples 2 and 3 on page 7 of the specification, falling within the scope of claim 1, are compared with a conventional mat made in the same manner in Example 1 except that the fibers in the mat of Example 1 are conventionally all the same length. The mats of claimed invention have significantly fewer "stand up fibers", requiring less coating than prior art mats to produce a paintable surface, as pointed out in the last two sentences of Examples 2 and 3 on page 7. If the "stand up fibers" are not covered by the coating, they will cause defects when the surface is painted.

Independent claim 5 involves a laminate comprising a nonwoven fibrous mat having a smooth surface for coating, page 1, lines 3-5 of the specification, and having a reduced amount of "stand-up" fibers, see page 2, lines 9-14, page 3, lines 5-9 and page 7, lines 6-8 and 15-19, the result of being comprised of a blend of at least two different lengths of fibers, about 25 to about 50 wt. percent of the fibers being less than about 0.4 inch long, see page 3, lines 6-7 & 12 and page 7, lines 3-4 & 14, and about 75 to about 50 wt. percent of the fibers having a length of at least 0.45 inch long, see page 3, lines 11-2 and page 7, lines 2-3 & 13, all of the fibers being in the range of about 0.12 inch to about 0.8 inch long, see page 3, lines 4-5 and having a diameter in the range of about 9 -14 microns, see page 4, lines 15-16, the fibers are bound together with about 10-25 wt. percent of a cured binder, original claim 1 and the mat is bonded to at least one layer of a different material, see page 3, lines 14-18. The combination of different fiber lengths in the ratio claimed produces an improved surface for painting or coating of the fibrous nonwoven mat, see Examples 2 and 3, particularly page 7, lines 6 & 16-19.

Grounds of Rejection to be Reviewed on Appeal:

1. Claims 1-8, 14 and 15 stand finally rejected under 35 USC 112, first paragraph, as lacking descriptive support for, "about 25 to about 50 wt. percent

fibers having a length of less than about 0.4 inch long and about 75 to about 50 wt. percent fibers having a length at least about 0.45 inch long."

2. Claims 1-8, 14 and 15 stand finally rejected under 35 USC 112, second paragraph as being vague and indefinite because of the phrase, "a reduced amount of stand up fibers."

3. Claims 3-4, 7-8, and 14-15 stand finally rejected under 35 USC 103(a) as being obvious from the disclosure of Peng et al, U.S. Pub. Patent Application No. 2003/0054714. The Examiner indicates that this is a new ground of rejection, but it seems to be the same as the rejection under 35 USC 103 set forth in the Final Rejection. The Final Rejection states that while Peng et al do not explicitly set forth the claimed ranges and proportions set forth in claims 3-4, 7-8 and 14-15, Peng et al does set forth using two different lengths of fibers to achieve high tear strengths and it would have been obvious for one of ordinary skill in this art to have selected the optimum lengths and proportions broadly disclosed by Peng et al through the process of routine experimentation to achieve optimum tear strength.

ARGUMENTS:

Ground #1 - Whether the specification provides descriptive support as required by 35 USC 112, first paragraph, for "about 25 to about 50 wt. percent fibers having a length of less than about 0.4 inch long and about 75 to about 50 wt. percent fibers having a length at least about 0.45 inch long."

The specification, which includes the original claims, does provide reasonable descriptive support for the limitations objected to for the following reasons:

1. The specification at page 3, in the Summary of the Invention, includes the following statement: .

"Preferably a major portion of the fiber is at least about 0.45 inch long and a minor portion of the fiber is shorter than about 0.4 inch."

It is well established that the claims are to be read in light of the specification and that the inventor is entitled to be his own lexicographer unless a term is used in a manner contrary to the ordinary meaning in the particular art most pertinent to the invention. It is well established that the term "major portion" in a two component system, in this case the fiber system made up of two portions, the fibers of each portion having a different length, means "greater" than the other portion, e. g. "greater in quantity" according to Funk and Wagnall's NEW STANDARD OF THE ENGLISH LANGUAGE, 1943 edition. Claim 1 contains the term phrase, "blend of fibers of at least two different lengths". In a two fiber length component system the major portion would be any quantity greater than about 50 wt. %, i.e. at least slightly larger than 50 wt. % such as 50.01 wt. % and the minor portion would be any quantity less than about 50 wt. % such as less than about 50 wt. % or less than 49.9999 wt. percent. This establishes the basis for the term "about 50 wt. percent" on each end of the range of the different length fiber portions.

2. Also, original claim 13, a part of the specification, states: "The method of claim 9 wherein about half of the fiber is at least about 0.45 inch long and a remainder of the fiber is less than about 0.4 inch long."

3. Original claim 8 states: "The mat of claim 5 wherein the mat contains about 75 wt. percent fiber that is at least about 0.45 inch long and about

25 wt. percent fiber that is about 0.2 inch long.”

4. Example 3 illustrates using a blend of about 50 % 0.5 inch and about 50% 0.2 inch fiber.
5. Example 2 illustrates using a blend of about 75 % .5 inch long fiber and about 25% fiber that was 0.2 inch long.

This disclosure clearly illustrates, and describes, to one of ordinary skill in the art that the “major portion” encompasses, at the very least, the range of about 50 wt. percent to about 75 wt. percent, and that the minor portion encompasses a range of about 25 wt. percent to about 50 wt. percent.

For these reasons Applicant believes the claims are in full compliance with the descriptive requirement of the first paragraph of 35 USC 112 and that the Examiner erred, and respectfully request the Board to reverse this rejection.

Ground # 2 - Whether the term “a reduced amount of stand up fibers” renders the claim vague and indefinite under 35 USC 112, second paragraph.

It is well established that the claims are to be read in the light of the specification. The last two paragraphs of the Background in the Specification explains the shortcomings of the prior art mats regarding stand up fibers, and Example 1, a representative prior art mat designed for coating, but shows requiring a heavy coating to cover up or reduce the “stand up” fibers. The second paragraph of the Summary of the Specification states that the invention

"minimizes the amount of stand up fibers", thus it is clear that "reduced" means "reduced from prior art mats. Also, Examples 2 and 3 (inventive mats) show improved smoothness, reduction in stand up fibers, and requiring less coating material than the prior art mat of Example 1, a mat made for coating, and a mat containing only one length of fibers, 1/2 inch long 10-11 micron fibers and that requires a heavy coating due to the frequency and nature of the stand up fibers.

Further, the term "a reduced amount of stand up fibers" is a property or characteristic of the claimed mats, a result of following the compositional limitations. The mats with "a reduced amount of stand up fibers" is a result of compositional limitations of the claims and therefore is a novel property of the claimed mats, a property not easily defined precisely because both the frequency and the length of the stand up fibers is important to the desirability and cost of the laminate containing the mat of the invention. The frequency and the length of the stand up fibers above the surface of the mat is significant to the desirability of the mat for coating, see page 2, last 5 lines of the last full paragraph, that states,

"It is also known to use off-line coating to make mats having good hiding and painting properties since the heavy coating surrounds and holds down the 'stand up' fibers, but the thick coating required adds considerable cost to the product. If there were fewer 'stand up' fibers and if the ends of these fibers were closer to the surface of the mat, substantially less coating material would be required."

Typically, the most practical and most reliable test of the frequency and nature of the "stand up fibers" is best determined by what is required to produce a coated mat suitable for painting rather than a painstaking microscopic test that at best would look at a very small area of mat.

For these reasons applicant believes that the Examiner has erred in rejecting the claims as being indefinite under 35 USC 112, second paragraph, and respectfully requests the Board of Appeals to reverse this rejection.

Claims 14 and 15, dependent from claims 1 and 5 respectively, appear to be redundant and should depend from claims 2 and 6 respectively.

Ground # 3 - Whether the invention of claims 3-4, 7-8, and 14-15 is made obvious under 35 USC 103(a) by the disclosure of Peng et al, described in Issue 3 above.

Claims 1-8 and 14-15 were rejected under 35 USC 103(a) as being unpatentable over, obvious from, the disclosure of Peng et al, Pub. Pat. App. No. 2003/0054714. The Examiner urges that the statement in Peng et al, "the mat comprises from about 0 to about 100 wt. percent of the fibers having an average length of from about 0.5 to about 60 mm (0.02 to 2.36 inches) and from about 0 to about 100 wt. percent of the fibers have an average length of about 10 to about 150 mm (0.39 – 5.9 inches), anticipates the applicants claimed invention. Peng et al's preferred combination of 20-80% fibers about 10-45 mm (0.39 - 1.77 inches) long and 20-80% of the fibers about 30-80 mm (1.18 to 3.15 inches) long is also so broad as to include 100% of the fibers that are 30-45 mm long, i.e. a mat having 100 % of 1.18 – 1.25 inch long fibers, and such is conventional for high tear mat. These broad statements of Peng et al about the fibers used in their invention, as the Examiner is using them, are so broad as to include almost any nonwoven mat ever made or that could ever will be made and thus defies common sense! Such broad statements do not reasonably suggest novel and different ranges of fiber length combinations, i.e. every nonwoven mat made thereafter regardless of the fiber lengths, and particularly when the fiber lengths claimed are different than disclosed by the reference, and produce a different, novel and useful result. Peng et al dealt with a problem of tear strength in mat while the applicant's invention deals with the problem of "stand up fibers", i.e. completely different problems.

The Examiner's interpretation of this broad statement, i.e. that high tear mat can be made with 100 % short fibers such as less than 1/2 inch, without any evidence in support, is incredible, and not believable by one experienced in making nonwoven glass fiber mats, i.e. one of ordinary skill in the art.

Allegations in any reference that are, because of the knowledge and experience of one of ordinary skill in the pertinent art, outrageous, are not to be taken as a legitimate teaching or reasonable suggestion that any embodiment falling within such a broad description meets the other descriptors of the invention. Note that this broad description of fiber lengths includes the prior art mat of present Example 1, and as shown by Examples 2 and 3, is different in kind than the claimed mats of the invention.

To be a legitimate teaching reference for the limitation or composition urged, the reference must not only enable the practice of that part of the invention, but also must first be credible in the mind of one of ordinary skill in the art. This reference fails both requirements with respect to the broad statement relied on by the Examiner because the limitations are so broad as to be obviously unnecessary. These limitations include 0-100 % of the fibers to be .5 mm (about 1/50th of an inch) to about 150 mm (about 6 inches). This ridiculously broad statement is so broad as to not require a blend of two fiber lengths.

Further, the shortest commercially available chopped glass fibers for use in wet processes for making wet laid mats are no shorter than about 0.067 (1/16th) inch long and the longest chopped fibers commercially available are shorter than 3 inches (about 76 mm) long. Therefore this broad statement of using fibers of about 1/50th of an inch long to about 6 inches long, the statement that the Examiner is relying on, is incredulous to one of ordinary skill in the art. In wet laid processes that Peng et al prefers, it is not known how to disperse and form a suitable mat from chopped fibers longer than about 3 inches, and practically, not longer than about 2 inches long. Those skilled in the art would not believe that part of Peng et al's broad statement that is being urged to encompass these limitations of the present invention.

Such a broad statement does not even warrant testing because those skilled in the art, knowing the effect of fiber length on tear strength of the mat, and the roofing product containing the mat, such as shingles, know that mats containing mixtures containing any significant amount of glass fibers of less than

3/4 -1/2 inch long cannot have tear strengths better than prior art roofing mats and ditto for roofing products, such as shingles. Note that Peng et al do not reasonably show that the fiber lengths of this broad range produce the high tear strengths in the mat and roofing product, the objective of the Peng invention. Instead, only fibers having lengths of 30-40 mm (1.18 – 1.6 inches) are shown to meet the objectives of high or higher tear strength. These fiber lengths are conventional in high tear strength mats. Therefore, those of ordinary skill in the art would conclude that the presence of fibers less than .8 inch or particularly less than .6 inch long (current spec., first paragraph of Detailed Description of the Invention) do not produce higher tear strength mat. Reading applicant's claims in light of the specification shows that the term "at least .45 inch long" is not unlimited on the maximum length, but instead is limited by the following disclosure taken from the first paragraph of Detailed Description of the Invention, which reads:

"A slurry of fibers is made by adding the fibers, having an average fiber diameter from about 9 to about 14 microns and lengths, preferably a blend of two lengths, of from about 0.12 to about 0.8 inch, preferably 0.2 to 0.6 inch, long, -----" (emphasis added)

The higher tear strength claimed by Peng et al is due to the presence of polysiloxane primarily, because the use of fibers as long as 30-40 mm fibers for high tear strength is well known. This is acknowledged by Peng et al in the paragraph 0035. Peng et al's disclosure that higher basis weight in the mat produces higher-tear strength is also well known. Therefore, Peng et al would not change the mindset of one of ordinary skill in the art that short glass fibers having lengths of less than about 1 inch long such as 1/2 inch long of shorter do not produce high tear strength in nonwoven mat. This is evidenced by Examples 1-7 of Peng et al and also all the Examples of a different inventor working for a different company, see US 5,518,586 discussed in Peng et al, see paragraph [0006]. In 5,515,586 the invention is a method of making a nonwoven glass fiber mat having high tear strength by modifying a urea

formaldehyde resin binder in a particular way, the mat being particularly useful in shingles. Note that in Peng et al, while a range of fiber lengths of 1/4 inch to 3 inches are said to be useful, the fiber length used in all of the examples is 1 inch long, col. 5, lines 60-62 col. 6, lines 14-15 and 52-53 and col. 7, lines 15-16 and 58-59.

A broad statement, certainly a ridiculously broad statement like the one being relied on by the Examiner, does not teach or reasonably suggest, even prima facie, the much more narrow limitation, such as fiber lengths of less than 1/2 inch, that produces results not taught or reasonably suggested by the reference – here a smoother surface and fewer “stand up fibers”. For example, the broad teaching that any organic resin will work cannot be a reasonable teaching, in the sense of 35 USC 102, that the use of a specific family of resins will produce results substantially different than taught by the reference. The Field of the Invention and the first sentence of both the Summary of the Invention and the Detailed Description of the Peng Invention states that the mats of the invention have “improved tear strength” that results in roofing products requiring improved tear strength. All of the examples shown by Peng et al used fibers, that were all at least 30 mm, i.e. at least 1.18 inches long! Peng et al does not teach how to make a roofing product having a high tear strength or any other product having improved tear compared to prior art products using a blend of fiber lengths like those described in the rejected claims. Further, the Peng et al reference is silent about the surface characteristics their mats.

If, on the other hand, Peng et al, by the use of this broad statement, is merely meaning that his invention, the application of polydimethylsiloxane to a wet web of glass fibers and polymer binders, is applicable to an extremely broad range of fiber lengths or an extremely broad range of mixed fiber lengths, which might be the case, then such statements cannot be reasonably interpreted to mean what the Examiner is urging it means, i.e. that Peng et al teaches making mats for roofing and building products having improved tear strengths, compared

to prior art products, using any combination of fiber lengths and percentages within his broad statement(s).

Further, Peng et al does not teach using 9-14 micron diameter fibers, the mats described in claims 3 and 4, or the laminates of claims 5-8, 14 and 15. For example, teaching using fibers within the range of 1-100 microns in diameter does not teach using fibers in a range of 9-14 microns and teaching using a combination of 0-100 wt. percent of fibers of one length and 100-0 wt. percent of fibers of a second length does not teach a mat of comprising fibers in which 25 wt. percent of the fibers are one length and 75 wt. percent of the fibers are a different length.

Still further, claims 3, 5 and 14-15 describe a mat in which about half the fiber is at least 0.45 inch long and the remainder of the fiber is less than 0.4 inch long. Peng et al does not teach or reasonably suggest such a combination. A still further example, claims 4 and 6 describe a mat in which about 75 wt. percent of the fiber is at least about 0.45 inch long and about 25 wt. percent of the fiber is about 0.2 inch long.

More importantly, this assertion is contrary to the evidence present in Peng et al including at least one patent discussed in Peng et al. As pointed out above, both Peng et al and the inventor Mirois in US Pat. No. 5,515,586 discussed in Peng et al, and therefore in the record as evidence since the citing of Peng et al, teach methods of making a nonwoven glass fiber mat having high tear strength for use in shingles. In setting forth the best mode, both references use fibers that are at least one inch long (Note that the fiber length used in all of the examples in '586 is 1 inch long, see col. 5, lines 60-62 col. 6, lines 14-15 and 52-53 and col. 7, lines 15-16 and 58-59). The fiber lengths used By Peng et al in the best mode shown in the Examples are at least 30 mm, 1.16 inches, long and up to 40 mm, 1.57 inches long. Therefore, the Peng et al disclosure leads those of ordinary skill in the art away from the claimed invention, mats alone or in laminates containing fibers from 0.12 inch long to 0.8 inches

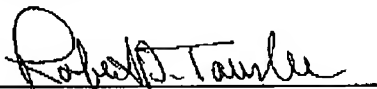
long. When a reference leads those skilled in the art away from the invention, it cannot be maintained that the reference makes the invention obvious under 35 USC 103.

For these reasons applicant believes the claims patentable 35 USC 103 and that the Examiner erred, and applicant respectfully request the Board to reverse this rejection.

Date: January 16, 2008

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Respectfully submitted,



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Appendix - Claims

List of claims involved in the appeal:

1. (Previously presented) A nonwoven fibrous mat having a smooth surface for coating, the smooth surface having a reduced amount of "stand up fibers" comprising a blend of fibers of at least two different lengths falling within the range of about 0.12 inch and about 0.6 inch bound together with a cured binder, the binder content of the mat being in the range of about 10-25 weight percent of the finished mat, the fibers having an average fiber diameter in the range of about 9 and about 14 microns and about 25 to about 50 wt. percent fibers having a length of less than about 0.4 inch long and about 75 to about 50 wt. percent fibers having a length at least about 0.45 inch long.
2. (Original) The mat of claim 1 wherein the binder is selected from a group consisting of an acrylic, a polyvinyl alcohol, a hydroxyl ethyl cellulose, a carboxyl methyl cellulose, a cellulose gums, a polyvinyl pyrrolidone, polyvinyl acetate, urea formaldehyde, melamine formaldehyde, with or without a crosslinking agent, with or without one or more plasticizers, and mixtures thereof.
3. (Original) The mat of claim 1 wherein about half of the fiber is at least about 0.45 inch long and a remainder of the fiber is less than about 0.4 inch long.
4. (Previously presented) The mat of claim 1 wherein the mat contains about 75 wt. percent fiber that is at least about 0.45 inch long and about 25 wt. percent fiber that is about 0.2 inch long.
5. (Previously presented) A laminate comprising a layer of nonwoven fiber mat having a smooth surface for coating, the smooth surface having a reduced amount of "stand up fibers" and comprising a blend of fibers of at least two different lengths falling within the range of about 0.12 inch and about 0.8 inch bound together with a cured binder, the binder content of the mat being in the range of about 10-25 weight percent of the finished mat, the fibers having an

average fiber diameter in the range of about 9 and about 14 microns, and about 25 to about 50 wt. percent fibers having a length of less than about 0.4 inch long and about 75 to about 50 wt. percent fibers having a length at least about 0.45 inch long, a surface of said mat being bonded to at least one layer of different material.

6. (Original) The laminate of claim 5 wherein the binder is selected from a group consisting of an acrylic, a polyvinyl alcohol, a hydroxyl ethyl cellulose, a carboxyl methyl cellulose, a cellulose gums, a polyvinyl pyrrolidone, polyvinyl acetate, urea formaldehyde, melamine formaldehyde, with or without a crosslinking agent, with or without one or more plasticizers, and mixtures thereof.

7. (Original) The laminate of claim 5 wherein about half of the fiber is at least about 0.45 inch long and a remainder of the fiber is less than about 0.4 inch long.

8. (Original) The mat of claim 5 wherein the mat contains about 75 wt. percent fiber that is at least about 0.45 inch long and about 25 wt. percent fiber that is about 0.2 inch long.

9-13 (Cancelled)

14. (Original) The mat of claim 1 wherein about half of the fiber is at least about 0.45 inch long and a remainder of the fiber is less than about 0.4 inch long.

15. (Original) The laminate of claim 5 wherein about half of the fiber is at least about 0.45 inch long and a remainder of the fiber is less than about 0.4 inch long.

EVIDENCE (ADDITIONAL) APPENDIX

None

RELATED PROCEEDINGS APPENDIX

NONE